

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/943,347

REMARKS

Claims 1-16 are all the claims pending in the application, including new claims 12-16 added by the present amendment.

Claims 1, 2, 3, 6 and 9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Clarke (US 5,799,100). Claims 5, 8 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Clarke in view of Abdel-Mottaleb (US 5,768,333).

Claims 4, 7 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The present invention relates to a system for detecting a prospective abnormal shadow in a radiation image on the basis of image data representing the radiation image, and a method of and an apparatus for judging whether a prospective abnormal shadow is malignant or benign.

Clarke relates to computer-assisted diagnostic (CAD) methods for the analysis of digital X-ray images or gray-scale images generated by other digital sensors, e.g., the analysis of mammography images.

Abdel-Mottaleb relates to identification of spots that may correspond to tumors using a two stage classification process in which a plurality of feature measures of extracted spots are calculated, and in a first classification stage, candidate suspect masses are identified based on the calculated feature measures. Then, in a second classification stage, so-called “true positives” are identified from among the candidate suspect masses, thereby rejecting so called “false positives.”

The malignancy judging means recited in claim 1 of the present application judges whether the prospective abnormal shadow is malignant or benign. Then, the prospective

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abnormal shadow information output means outputs the information indicating the result obtained by the malignancy judging means, on the perspective abnormal shadow, so that the information can be distinguished (malignant or benignant).

As described in new claim 15, whether the prospective abnormal shadow is malignant or benignant as judged by the malignancy judging means is distinguished visually.

In contrast, the Clark reference does not disclose that a result as “malignant” and a result as “benignant” are output in such a manner that whether the prospective abnormal shadow is malignant or benignant as judged by the malignancy judging means can be distinguished.

Thus, the system of claim 1 is not disclosed in the Clark reference or easily obtained from the Clark reference. Therefore, Applicant submits that claim 1 and its dependent claims 2 and 3 are not anticipated by Clarke.

Also, claim 3 recites that the malignancy judging means judges whether the prospective abnormal shadow detected by the prospective abnormal shadow detecting means is malignant or benignant by obtaining a benignancy evaluation function value which is a value of an evaluation function for benignancy, a malignancy evaluation function value which is a value of an evaluation function for malignancy, and a normalcy evaluation function value which is a value of an evaluation function for normalcy by defining feature values of the image data by a predetermined function. Applicant submits that Clarke fails to disclose this feature of the claim. The Examiner refers to element 5 of FIG. 1 and col. 16, lines 9-13 of Clarke as allegedly disclosing this feature of the claim. In particular, the Examiner asserts that the step of classifying tissue as either mass or normal creates a normalcy function. Applicant disagrees.

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Recited in claim 3 is a normalcy evaluation function value which is a value of an evaluation function for normalcy by defining feature values of the image data by a predetermined function. By contrast, Clarke discloses designating a portion of tissue as either a mass or normal tissue. Such a designation is simply an indication of normal or not normal. Clarke's designation does not describe a value of an evaluation function for normalcy by defining feature values of the image data by a predetermined function, as recited in the claim. Thus, claim 3 is not anticipated by Clarke for this additional reason.

For the rejections of claims 6 and 9, Applicant submits that these claims are not anticipated by Clarke for reasons analogous to those for claim 1.

Regarding claims 5, 8 and 11, Applicant submits that these claims are allowable over the prior art, at least because of their dependence from claims 1, 6 and 9, respectively, and because Abdel-Mottaleb fails to make up for the deficiencies of Clarke.

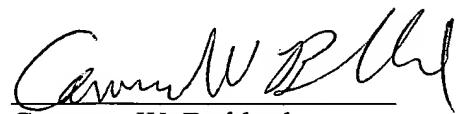
New claims 12-16 are added to further define the present invention. These claims are allowable at least because of their dependence from claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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AMENDMENTS TO THE DRAWINGS

FIG. 1 is amended herein to change “SEQUARE” to “SQUARE” in element B1.

Attachment: Replacement Sheet for FIG. 1